

**IN THE DRAWINGS:**

Three attached sheets of drawings include changes to Figures 1, 5 and 6. These sheets, which include Figures 1, 5 and 6, replace the original sheets including Figures 1, 5 and 6.

Specifically, Figures 1, 5 and 6 have been amended to replace the character reference “12” with the character reference --6--. In addition, Figure 1 has been amended to include reference characters “1b,” “2b,” “1r,” and “2r,” and to include previously omitted character reference “16.”

Figure 6 has been additionally amended to label the figure as “Prior Art” in accordance with MPEP § 608.02(g).

Attachment: Three replacement sheets

Annotated sheets showing changes

**REMARKS**

The specification has been amended to provide reference characters “1b” and “2b,” respectively, to designate the “bottoms” of the corresponding reactor structural components 1 and 2 shown in Figure 1. Likewise, the characters “1r” and “2r,” respectively, have been added to designate the “circular recessions” of the corresponding reactor structural components 1 and 2 shown in Figure 1. Figure 1 has also been amended to include the newly added character references, and to include the previously omitted character reference “16.”

Applicants respectfully traverse the Examiner’s objection to the drawings, under 37 C.F.R. § 1.83(a), directed to the “connector” recited in claim 9 (Office Action, dated July 2, 2004, page 3, lines 9-11) because this claimed feature is already illustrated in Figure 5 and is designated by reference character “23” (See also the specification as originally filed, page 17, lines 5-7).

Claims 2-4 have been canceled without prejudice. Claims 1, 5, 6, 8 and 10 have been amended. Specifically, claim 1 has been amended to incorporate the subject matter of original claim 2. Furthermore, claim 1 has been amended to recite that “there is no filter in the interior space” as supported by page 6, lines 4-6, page 18, lines 4-6, and Figures 1, 4, 5 and 6 of the application as originally filed. Claims 5, 6, 8 and 10 have been amended to reflect the cancellation of claim 3.

The present amendment adds no new matter to the application.

**The Invention**

The present invention pertains to improvements in a reactor for generating moisture, such as would be used in the semiconductor manufacturing industry. In particular, in a first embodiment in accordance with the present invention, a “reactor for generating moisture” is provided that includes a reactor shell with an interior space formed therein subject to the

limitation that “there is no filter in the interior space.” Furthermore, the “reactor for generating moisture” in accordance with the present invention includes an “inlet reflector” and an “outlet reflector,” wherein “there is a tapered portion formed at peripheral edge portions of said inlet reflector...and said outlet reflector.”

Various other embodiments in accordance with the present invention are recited in the dependent claims. An important advantage of reactors for generating moisture, in accordance with the present invention, is that the tapered portions of the inlet reflector and the outlet reflector, along with the absence of a “filter” in the interior space, prevents the temperature from rising locally on the inside wall surface of the reactor (See instant specification, page 18, lines 18-20). This result helps maintain temperatures inside of the reactor below the ignition point for hydrogen gas, which avoids harmful backfire ignitions of hydrogen gas mixtures while the reactor is operating.

### **The Rejections**

Claim 9 stands rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Claims 1, 2, 5-11 and 13 stand rejected under 35 U.S.C. § 102(b) as anticipated by WO 98/57884 (hereafter, the WO’884 Document). Claims 1, 2, 5-11 and 13 stand rejected under 35 U.S.C. § 102(b) as anticipated by EP 0 878 443 A1 (hereafter, the EP’443 Document). Claims 1, 2, 5, 7 and 8 stand rejected under 35 U.S.C. § 102(b) as anticipated by JP 10-297907 (hereafter, the JP’907 Document). Claims 1, 2, 5 and 7-11 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,334,962 to Minami et al. (hereafter, the Minami Patent). Claims 1, 2, 5, 7 and 8 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,180,067 to Ohmi et al. (hereafter, the Ohmi’067 Patent).

Claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable over any one of the following references: the WO’884 Document, the EP’443 Document or the Minami Patent.

Claims 1, 2, 5, 7 and 8 stand rejected under the judicially created doctrine of obviousness-type double patenting over claims 1, 4 and 6 of the Ohmi'067 Patent. Claims 1, 2, 5, 7 and 8 stand rejected under the judicially created doctrine of obviousness-type double patenting over claims 1, 10-12, 16, 17, 20 and 21 of U.S. Patent 6,733,732 B2 to Ohmi et al. (hereafter, the Ohmi'732 Patent). Claims 1, 2, 8 and 10-12 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1 and 7-18 of co-pending U.S. Patent Application No. 09/773,605 to Ohmi et al. (hereafter, the Ohmi'605 Application).

Applicants respectfully traverse the rejections and request reconsideration of the present application for the following reasons.

### **Applicants' Arguments**

Applicants assert that the language of claim 9 particularly points out and distinctly claims the subject matter of the invention in compliance with 35 U.S.C. § 112. Specifically, the term “alternated” as recited in claim 9 is clear and definite as supported by Figure 5 and on page 17, lines 5-7, of the disclosure as originally filed. The phrase “small-diameter and large-diameter pipe sections are alternated to form a pipe” is a clear description on its face, and uses the term “alternated” consistent with the common usage, which is “to interchange repeatedly and regularly with one another in...place” (See Random House Webster’s college dictionary, p. 41, 1990).

### **The Prior Art Rejections**

Anticipation under 35 U.S.C. § 102 requires showing the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 221 U.S.P.Q. 481,

485 (Fed. Cir. 1984). On the other hand, a patentability analysis under 35 U.S.C. § 103 requires (a) determining the scope and content of the prior art, (b) ascertaining the differences between the prior art and the claimed subject matter, (c) resolving the level of ordinary skill in the pertinent art, and (d) considering secondary considerations that may serve as indicia of nonobviousness or obviousness. Graham v. John Deere Co. of Kansas City, 148 U.S.P.Q. 459, 467 (1966). Furthermore, a proper rejection under Section 103 further requires showing (1) that the prior art would have suggested to a person of ordinary skill in the art that they should make the claimed device or carry out the claimed process, (2) that the prior art would have revealed to a person of ordinary skill in the art that in so making or doing, there would have been a reasonable expectation of success, and (3) both the suggestion and the reasonable expectation of success must be found in the prior art and not in the applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

### **The WO'884 Document**

The WO'884 Document teaches a "method for generating water for semiconductor production" as described in the English Abstract, and U.S. Patent 6,093,662 to Ohmi et al. (hereafter, the Ohmi'662 Patent) is a U.S. Patent family equivalent of the WO'884 Document. Therefore, Applicants will use the teachings of the Ohmi'662 Patent to characterize the WO-884 Document.

As shown in Figure 9, of both documents, a reactor (1) includes structural components (2) and (3) connected together to form a space (unlabeled) in which an inlet reflector unit (8), an outlet reflector unit (9), and a diffusion filter (10) are disposed.

The WO'884 Document and the Ohmi'662 Patent do not teach, or even suggest, the following elements of claim 1: (i) "there is a tapered edge portion formed at peripheral edge portions of said inlet reflector...and said outlet reflector," and (ii) "there is no filter in the

interior space.” Therefore, the rejection under 35 U.S.C. § 102(b) based on the WO’884 Document is untenable and must be withdrawn.

### **The EP’443 Document**

The EP’443 Document teaches a “method for generating moisture, reactor for generating moisture, method for controlling temperature of reactor for generating moisture, and method for forming platinum-coated catalyst layer” as summarized in the Abstract. In particular, the EP’443 Document teaches a reactor (21) including reactor bodies (22), (23) connected together to form a space including recesses (22a) and (23a). Within this space, reactor plates (29a) and filter (30) in filter retainer (31) are disposed.

However, the EP’443 Document does not teach, or even suggest, the following elements of claim 1: (i) “there is a tapered edge portion formed at peripheral edge portions of said inlet reflector...and said outlet reflector,” and (ii) “there is no filter in the interior space.” Therefore, the rejection under 35 U.S.C. § 102(b) based on the EP’443 Document is untenable and must be withdrawn.

### **The JP’907 Document**

The JP’907 Document teaches, in Figure 1, a “reactional furnace for generating moisture” such as described as prior art in Figure 6 and on page 1, line 18, to page 5, line 7, of the present application. As illustrated in Figure 1 of the JP’907 Document, the reactor includes a reactional furnace body (1) formed by combining two furnace body members (2) to form a space (1a) therebetween. Within the space (1a), an inlet side reflector (5), an outlet side reflector (12) and a metal filter (10) are disposed.

However, the JP’907 Document does not teach, or even suggest, the following elements of claim 1: (i) “there is a tapered edge portion formed at peripheral edge portions of said inlet

reflector...and said outlet reflector," and (ii) "there is no filter in the interior space." Therefore, the rejection under 35 U.S.C. § 102(b) based on the EP'443 Document is untenable and must be withdrawn.

### **The Minami Patent**

The Minami Patent teaches a "low flow moisture supply process" and describes an apparatus for the generation of moisture, as shown in Figure 7, which is a reactor (1). Reactor (1) includes reactor structural components (2) and (3) connected together to form a space (unlabeled) therein, and within this space an inlet side reflector unit (9), an outlet side reflector unit (12) and a filter (10) are disposed.

However, the Minami Patent does not teach, or even suggest, the following elements of claim 1: (i) "there is a tapered edge portion formed at peripheral edge portions of said inlet reflector...and said outlet reflector," and (ii) "there is no filter in the interior space." Therefore, the rejection under 35 U.S.C. § 102(e) based on the Minami Patent is untenable and must be withdrawn.

### **The Ohmi'067 Patent**

The Ohmi'067 Patent teaches a "reactor for the generation of water," such as shown in Figures 1, 8, 11 and 13, wherein the reactor shell (1) includes a first reactor structural component (2) and a second reactor structural component (3) united to define a sealed interior space (1a), (See Abstract). The space (1a) is partitioned by a diffusion filter (10), and at opposite sides of the space (1a) an inlet reflector unit (9) and an outlet reflector unit (11) are disposed.

However, the Ohmi'067 Patent does not teach, or even suggest, the following elements of claim 1: (i) "there is a tapered edge portion formed at peripheral edge portions of said inlet

reflector...and said outlet reflector," and (ii) "there is no filter in the interior space." Therefore, the rejection under 35 U.S.C. § 102(e) based on the Ohmi'067 Patent is untenable and must be withdrawn.

### **The Section 103 Rejection**

The Examiner contends that the subject matter of claim 12 of the present application would be obvious under 35 U.S.C. § 103(a) over any one of the following references: WO'884 Document, the EP'443 Document or the Minami Patent (Office Action, dated July 2, 2004, page 15, lines 1-14). However, claim 12 depends indirectly upon claim 1, and none of the WO'884 Document, the EP'443 Document or the Minami Patent teach each and every feature of claim 1. Therefore, for the reasons discussed above, these references cannot render obvious the subject matter of claim 12.

Furthermore, the Examiner argues that the subject matter of claim 12, wherein the "cooler is fins fixed on the outer surface of said reactor shell," would have been recognized by a person of ordinary skill in the art as an obvious expedient. The Examiner has provided no prior art reference in support of this position. The Federal Circuit has ruled that reliance on mere basic knowledge or common sense when evaluating patentability, in place of evidence in the record, is impermissible. In re Zurko, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001). Therefore, Applicants respectfully traverse the Examiner's use of Official Notice, or reliance on basic knowledge, and require the Examiner to provide a prior art reference in support of her assertion or properly withdraw the rejection.

### **Obviousness-type Double Patenting Rejections**

The Federal Circuit has ruled that in order to justify a double patenting rejection an analysis of the claims at issue are required, and not an analysis limited to the disclosure of the

patents whose claims are relied upon to demonstrate double patenting. General Foods Corp. v. Studiengesellschaft Kohle mbH, 23 U.S.P.Q.2d 1839, 1846 (Fed. Cir. 1992). The disclosure of the patent cited in support of the double patenting rejection cannot be used as though it were prior art. Id. In particular, the Federal Circuit has held that an obviousness-type double patenting rejection involves two inquires: first, is the same invention claimed twice, and second, if not, does the pending claim define merely an obvious variation of the patented claim. In re Goodman, 29 U.S.P.Q.2d 2010, 2016 (Fed. Cir. 1993).

In the present case, the Examiner has not established a prima facie case of obviousness-type double patenting because the Examiner has not compared the claims of the Ohmi'067 Patent, the Ohmi'732 Patent and the Ohmi'605 Application to the claims of the present application. However, to facilitate prosecution, Applicants provide such a comparison in the Tables that follow.

### **Claims of the Ohmi'067 Patent**

Claim 1 of the present application is the only independent claim alleged by the Examiner to be unpatentable in view of claims 1, 4 and 6 of the Ohmi'067 Patent. Claims 1 and 4 of the Ohmi'067 Patent are independent claims, whereas claim 6 depends upon each of claims 1 and 4. In order to overcome the Examiner's obvious-type double patenting rejection, all Applicants need establish is that the subject matter of claim 1 of the present invention, when compared to claims 1 and 4 of the Ohmi'067 Patent, has not been claimed twice and that the pending claims do not define merely an obvious variation of the patented claims. The subject matter of claim 1 of the present invention is compared to the subject matter of claims 1 and 4 of the Ohmi'067 Patent in Tables I and II, respectively, below.

TABLE I

U.S. Patent 6,180,067 B1	U.S. Patent Application No. 09/905,209
Claim 1. A reactor for the generation of moisture by the reaction of hydrogen and oxygen to produce water, said reactor comprising:	Claim 1. A reactor for generating moisture, comprising:
a reactor shell having a first reactor structural component and a second reactor structural component, said structural components being united to define a sealed interior space;  <b>[No requirement that the first and second components are joined together by welding]</b>	a reactor shell with an inlet side and an outlet side, said reactor shell comprising: a reactor structural component on the inlet side; and a reactor structural component on the outlet side; wherein an interior space is formed with said reactor structural component on the inlet side and said reactor structural component on the outlet side disposed opposite each other and joined together by welding;
a diffusion filter partitioning said sealed interior space into a first chamber and a second chamber;	<b>Does not have this filter, and there are no first and second chambers.</b> [In fact, the present claim excludes the presence of a filter in the interior space]
a starting material gas feed port in said first reactor structural component for supplying a starting material gas to said sealed interior space;	a gas feed port engaged with said reactor structural component on the inlet side;
a water vapor outlet port in said second reactor structural component for leading water produced in said sealed interior space out of said sealed interior space;	a moisture gas take-out port engaged with said reactor structural component on the outlet side;
a reflector unit disposed in said first chamber opposite said starting material gas feed port, said reflector unit comprising a cylindrical casing fixed on said first reactor structural component, side openings formed in said cylindrical casing, and a reflector closing an end opening of said cylindrical casing;	an inlet reflector disposed on the inside wall of said reactor structural component on the inlet side, positioned opposite to said gas feed port in the interior space of the reactor;  <b>[No cylindrical casing recited]</b>
a reflector-diffuser unit disposed in said second chamber opposite said water vapor outlet port, said reflector-diffuser unit comprising a further cylindrical casing fixed on said second reactor structural component, side openings formed in said further cylindrical casing, a reflector closing an end opening of said further cylindrical casing, an outlet diffusion filter provided inside said further cylindrical casing, and a platinum coated catalyst layer formed on the outlet	an outlet reflector disposed on the inside wall of the said reactor structural component on the outlet side, positioned opposite to said moisture gas take-out port in the interior space of the said reactor; and  <b>[No outlet diffusion filter recited. No cylindrical casing recited]</b>

diffusion filter; and,	
a platinum coated catalyst layer formed on the inside surface of said second reactor structural component.	a platinum coat catalyst layer formed on the inside wall of said reactor structural component on the outlet side;
[Does not recite reacting hydrogen and oxygen into water in a non-combustion state]	wherein hydrogen and oxygen are fed into the interior space of said reactor through said gas feed port and brought into contact with said platinum coat catalyst layer to activate the reactivity of the hydrogen and oxygen, thereby reacting hydrogen and oxygen into water in a non-combustion state; wherein
<b>[No round recession recited, and no gap recited between an outlet reflector and the inside wall of the reactor structural component]</b>	a round recession with a flat bottom is formed on inside walls of said reactor structural component on the inlet side and said reactor structural component on the outlet side; a gap is formed between said outlet reflector and the inside wall of said reactor structural component on the outlet side, and
<b>[No tapered portion formed at peripheral edge portions of any reflector]</b>	wherein there is a tapered portion formed at peripheral edge portions of said inlet reflector facing the inside wall of said reactor structural component on the inlet side and said outlet reflector facing the inside wall of said reactor structural component on the outlet side; and wherein a gap is formed between said inlet reflector and the inside wall of said reactor structural component on the inlet side, and
<b>[Cannot meet this limitation because Claim 1 of the Ohmi'067 Patent has a diffusion filter partitioning the interior space]</b>	wherein there is no filter in the interior space.

TABLE II

U.S. Patent 6,180,067 B1	U.S. Patent Application No. 09/905,209
Claim 4. A reactor for the generation of moisture by the reaction of hydrogen and oxygen to produce water, said reactor comprising:	Claim 1. A reactor for generating moisture, comprising:
a reactor shell having a first reactor structural component and a second reactor structural component, said structural components being united to define a sealed interior space;	a reactor shell with an inlet side and an outlet side, said reactor shell comprising: a reactor structural component on the inlet side; and a reactor structural component on the outlet side; wherein an interior space is
<b>[No requirement that the first and second</b>	

<b>components are joined together by welding]</b>	formed with said reactor structural component on the inlet side and said reactor structural component on the outlet side disposed opposite each other and joined together by welding;
a diffusion filter partitioning said sealed interior space into a first chamber and a second chamber;	<b>Does not have this filter, and there are no first and second chambers.</b> [In fact, the present claim excludes the presence of a filter in the interior space]
a starting material gas feed port in said first reactor structural component for supplying a starting material gas to said sealed interior space;	a gas feed port engaged with said reactor structural component on the inlet side;
a water vapor outlet port in said second reactor structural component for leading water produced in said sealed interior space out of said sealed interior space;	a moisture gas take-out port engaged with said reactor structural component on the outlet side;
a reflector unit disposed in said first chamber opposite said starting material gas feed port, to diffuse said starting material gas supplied from said starting material gas feed port;	an inlet reflector disposed on the inside wall of said reactor structural component on the inlet side, positioned opposite to said gas feed port in the interior space of the reactor;  <b>[There is no first chamber to place the reflector in]</b>
a disk reflector unit disposed in said second chamber, said disk reflector unit being concentric with said water vapor outlet port and spaced from said second reactor structural component by from 0.5 to 2.0 mm; and,	an outlet reflector disposed on the inside wall of the said reactor structural component on the outlet side, positioned opposite to said moisture gas take-out port in the interior space of the said reactor; and  <b>[Does not recite a disk reflector unit disposed in a second chamber that is concentric with the water vapor outlet port and spaced from the reactor structural component by from 0.5 to 2.0 mm]</b>
a platinum coated catalyst layer formed on the inside surface of said second reactor structural component.	a platinum coat catalyst layer formed on the inside wall of said reactor structural component on the outlet side;
[Does not recite reacting hydrogen and oxygen into water in a non-combustion state]	wherein hydrogen and oxygen are fed into the interior space of said reactor through said gas feed port and brought into contact with said platinum coat catalyst layer to activate the reactivity of the hydrogen and oxygen, thereby reacting hydrogen and oxygen into water in a non-combustion state; wherein
<b>[Does not recite a round recession with a flat bottom]</b>	a round recession with a flat bottom is formed on inside walls of said reactor structural component on the inlet side and

	said reactor structural component on the outlet side; a gap is formed between said outlet reflector and the inside wall of said reactor structural component on the outlet side, and
<b>[Does not recite a tapered portion formed at peripheral edge portions of any reflector]</b>	wherein there is a tapered portion formed at peripheral edge portions of said inlet reflector facing the inside wall of said reactor structural component on the inlet side and said outlet reflector facing the inside wall of said reactor structural component on the outlet side; and wherein a gap is formed between said inlet reflector and the inside wall of said reactor structural component on the inlet side, and
<b>[Cannot meet this limitation because Claim 4 of the Ohmi'067 Patent has a diffusion filter partitioning the interior space]</b>	wherein there is no filter in the interior space.

As demonstrated by Tables I and II, there are multiple differences, and mutually exclusive and/or missing elements, between claim 1 of the present invention and claims 1 and 4 of the Ohmi'067 Patent. First, the Examiner has not shown that the same invention has been claimed twice, General Foods Corp. v. Studiengesellschaft Kohle mbH, 23 U.S.P.Q.2d at 1840, and it is clear from Tables I and II that the claims are not identical in scope. Secondly, claim 1 of the present invention precludes having a filter disposed in the interior space; therefore, the invention claimed by claims 1 and 4 of the Ohmi'067 Patent represent neither a genus nor a species of the invention claimed in claim 1 of the present application. Consequently, since no prima facie case of obviousness-type double patenting has been established by the Examiner the double patenting rejection must be withdrawn.

### **Claims of the Ohmi'732 Patent**

Claim 1 of the present application is the only independent claim alleged by the Examiner to be unpatentable in view of claims 1, 10-12, 16, 17, 20 and 21 of the Ohmi'732 Patent. Claim 1 of the Ohmi'732 Patent is the only independent claim of the reference and

claims 10-12, 16, 17, 20 and 21 all depend either directly or indirectly upon claim 1. In order to overcome the Examiner's obvious-type double patenting rejection, all Applicants need establish is that the subject matter of claim 1, when compared to the subject matter of claim 1 of the Ohmi'732 Patent, has not been claimed twice and that the pending claims do not define merely an obvious variation of the patented claims. To clearly rebut the Examiner's obviousness-type double patenting rejection, the subject matter recited by claim 1 of the present invention is compared to the subject matter recited in claim 1 of the Ohmi'732 Patent in Table III provided below.

TABLE III

U.S. Patent 6,733,732 B2	U.S. Patent Application No. 09/905,209
Claim 1. A water-generating reactor comprising:	Claim 1. A reactor for generating moisture, comprising:
a reactor body made of a heat-resistant metal, the reactor body comprising a first reactor body member welded to a second reactor body member, wherein the inlet and the outlet are mounted on the reactor body, the outlet is a water and moisture gas take-out joint, the passage is an internal space defined by recesses inside the reactor body, and the recesses include a first spherical recess having a first surface and a second spherical recess having a second surface; [Recites a "first spherical recess" and a "second spherical recess" that has a different geometry from the "round recession with a flat bottom" recited in claim 1 of Application No. 09/905,209]	a reactor shell with an inlet side and an outlet side, said reactor shell comprising: a reactor structural component on the inlet side; and a reactor structural component on the outlet side; <b>[Does not recite a heat-resistant metal]</b>
a passage formed in the reactor, wherein the inlet is disposed at one end of the passage and the outlet is disposed at another end of the passage so that the hydrogen and oxygen flows through the inlet and into the passage;	wherein an interior space is formed with said reactor structural component on the inlet side and said reactor structural component on the outlet side disposed opposite each other and joined together by welding;
an inlet to receive hydrogen and oxygen;	a gas feed port engaged with said reactor structural component on the inlet side;
an outlet to expel water;	a moisture gas take-out port engaged with said reactor structural component on the outlet side;

[Does not recite an inlet reflector]	an inlet reflector disposed on the inside wall of said reactor structural component on the inlet side, positioned opposite to said gas feed port in the interior space of the reactor;
[Does not recite an outlet reflector]	an outlet reflector disposed on the inside wall of the said reactor structural component on the outlet side, positioned opposite to said moisture gas take-out port in the interior space of the said reactor; and
a platinum coating film is disposed only on the surface of the first recess,	a platinum coat catalyst layer formed on the inside wall of said reactor structural component on the outlet side;
wherein when the hydrogen and oxygen supplied by the inlet and diffused contact the platinum coating film, water is generated by a reaction between the hydrogen and the oxygen.	wherein hydrogen and oxygen are fed into the interior space of said reactor through said gas feed port and brought into contact with said platinum coat catalyst layer to activate the reactivity of the hydrogen and oxygen, thereby reacting hydrogen and oxygen into water in a non-combustion state; wherein
[Does not recite a “gap...formed between said outlet reflector and the inside wall of said reactor structural component]	a round recession with a flat bottom is formed on inside walls of said reactor structural component on the inlet side and said reactor structural component on the outlet side; a gap is formed between said outlet reflector and the inside wall of said reactor structural component on the outlet side, and [Recites a “round recession with a flat bottom” that has a different geometry from the “first spherical recess” and the “second spherical recess” recited in claim 1 of the Ohmi’732 Patent]
[Does not recited the “tapered portion formed at peripheral edge portions of said inlet reflector... and said outlet reflector” and does not recite the “gap...formed between said inlet reflector and the inside wall of said reactor structural component on the inlet side”]	wherein there is a tapered portion formed at peripheral edge portions of said inlet reflector facing the inside wall of said reactor structural component on the inlet side and said outlet reflector facing the inside wall of said reactor structural component on the outlet side; and wherein a gap is formed between said inlet reflector and the inside wall of said reactor structural component on the inlet side, and
Does not include this limitation. {Of note, dependent claims 11 and 12 of the Ohmi’732 Patent each recite a “filter” that is disposed in the interior space.}	wherein there is no filter in the interior space.

As demonstrated by Table III, there are multiple differences, and mutually exclusive and/or missing elements, between claim 1 of the present invention and claim 1 of the Ohmi'732 Patent. First, the Examiner has not shown that the same invention has been claimed twice, General Foods Corp. v. Studiengesellschaft Kohle mbH, 23 U.S.P.Q.2d at 1840, and it is clear from Table III that the claims are not identical in scope. Secondly, claim 1 of the present invention precludes having a filter disposed in the interior space; therefore, the invention claimed by claim 1 of the Ohmi'732 Patent represents neither a genus nor a species of the invention claimed in claim 1 of the present application. Consequently, since no prima facie case of obviousness-type double patenting has been established by the Examiner, the double patenting rejection must be withdrawn.

### Claims of the Ohmi'605 Application

Claim 1 of the present application is the only independent claim alleged by the Examiner to be provisionally unpatentable in view of claims 1, 2, 8 and 10-12 of the co-pending Ohmi'605 Application. Claim 1 of the Ohmi'605 Application is the only independent claim of the reference asserted against the claims of the present application. However, the Examiner's obviousness-type double patenting rejection against the present claims is merely a provisional rejection based upon claims of the co-pending Ohmi'605 Application. As no claim has yet been allowed in the Ohmi'605 Application, Applicants assert that the issue is moot at the present stage of prosecution. Therefore, Applicants will defer further comment regarding the Examiner's provisional obviousness-type double patenting rejection based on the Ohmi'605 Application until after there is an allowed claim in the Ohmi'605 Application warranting an obviousness-type double patenting analysis.

**Conclusion**

Claims 1 and 5-13 are in compliance with 35 U.S.C. § 112. Furthermore, the Examiner's rejection of independent claim 1 under 35 U.S.C. § 102(b) is untenable and must be withdrawn because neither the WO'884 Document, the EP'443 Document, the JP'907 Document, the Minami Patent, nor the Ohmi'067 Patent teach, or even suggest, the following features of claim 1: (i) "there is a tapered edge portion formed at peripheral edge portions of said inlet reflector...and said outlet reflector," and (ii) "there is no filter in the interior space."

In addition, the Examiner has failed to establish that the subject matter recited in independent claim 1 of the present invention amounts to being subject matter defining merely an obvious variant of patented claims of the Ohmi'067 Patent and the Ohmi'732 Patent. Therefore, the Examiner's obviousness-type double patenting rejection of the instant claims over the subject matter of the claims of the Ohmi'067 Patent and the Ohmi'732 Patent is also untenable and must be withdrawn.

Lastly, Applicants defer further comment regarding the Examiner's provisional rejection of claims of the present invention over claims of the Ohmi'605 application until such time as there is an allowed claim in the Ohmi'605 Application meriting further comment.

For all of the above reasons, claims 1 and 5-13 of the present application are in condition for allowance and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below-signed attorney for applicants.

Respectfully submitted,

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**al-so-ran'**, *n.* 1. (in a race) a contestant who fails to win or to place among the first three finishers. 2. a person who loses a contest, election, or other competition. 3. a person who attains little or no success. [1895-1900]

1. alteration. 2. alternate. 3. altitude. 4. alto.

**Alta**, Alberta.

**Al-tai** or **Al-tay** (al'tā), *n.* a territory of the RSFSR, in the S Soviet Union in Asia. 2,675,000; 101,000 sq. mi. (261,700 sq. km). *Cap.*: Barnaul.

**Al-ta-ic** (al tā'ik), *n.* 1. the Turkic, Mongolian, and Tungusic language families collectively: variously considered to be a single, genetically related family, with Japanese and Korean sometimes also included, or a group of languages with shared typologies and histories that are not descended from a common ancestor. —*adj.* 2. of or pertaining to Altaic. [1825-35]

**Al-tai Mountaintains**, *n.pl.* a mountain range in central Asia, mostly in Mongolia and the S Soviet Union. Highest peak, Belukha, 15,157 ft. (4506 m).

**Al-tair** (al'tār, -tēr, al tār', -tēr'), *n.* a first-magnitude star in the constellation Aquila. [*< Ar (al-nasr) al-tār* (the) flying (eagle)]

**Al-ta-mir-a** (al tā mēr'ā), *n.* a cave in N Spain, near Santander, noted for its Upper Paleolithic polychrome paintings of bison, deer, and pigs.

**al-tar** (äl'tär), *n.* 1. an elevated place or structure, as a mound or platform, at which religious rites are performed or on which sacrifices are offered to gods, ancestors, etc. 2. COMMUNION TABLE. —*Idiom.* 3. lead to the altar, to marry. [bef. 1000; ME *ofer* *alter* < L *altaria* (pl.)]

**al-tar boy'**, *n.* ACOLYTE (def. 1). [1765-75]

**al-tar-piece** (äl'tär pēs'), *n.* a painted or carved screen behind or above the altar or communion table in Christian churches; reredos. [1635-45]

**al-tar rail'**, *n.* the rail in front of an altar, separating the sanctuary from the rest of the church. [1855-60]

**al-tar stone'**, *n.* MENSA. Also called **al-tar slab'**. [1275-1325]

**alt-az-i-muth** (äl tāz'ə mōth), *n.* an instrument for determining both the altitude and the azimuth of a heavenly body. [1855-60; ALTITUDE + AZIMUTH]

**Alt-dorf** (äl'tōrf), *n.* a town in and the capital of Uri, in central Switzerland, near Lucerne: legendary home of William Tell. 8600.

**al-ter** (äl'tär, v., -ter, -ter-ing, —v.t. 1. to make different in some particular, as size, style, course, or the like; modify: *to alter a coat*; *to alter a will*. 2. to castrate or spay. —v.i. 3. to change; become different or modified. [1350-1400; ME < OF *alterer* < LL *alterare* to change, worsen, der. of L *alter* other] —*al-ter-a-ble*, *adj.* —*al-ter-a-bil-i-ty*, *n.* —*al-ter-a-bly*, *adv.* —*al-ter-er*, *n.* —*Syn.* See *ADJUST*, *CHANGE*.

**al-ter-a-tion** (äl'tär ə shān), *n.* 1. the act of altering or the state of being altered. 2. a change; modification or adjustment: *There has been an alteration in our plans*. [1350-1400; ME < ML]

**al-ter-cate** (äl'tär kāt'), *v.i.*, *-cat-ed*, *-cat-ing*, to argue or quarrel with intensity; wrangle. [1530-40; < L *altercātus*, pp. of *altercāre* to quarrel, v. der. of \**altercus* dispute = *alter* other + *-cus* formative suffix]

**al-ter-ca-tion** (äl'tär kā'shən), *n.* a heated or angry dispute; noisy argument or controversy. [1350-1400; ME < L]

**al-ter-ego** (äl'tär ēgō, ēgō', äl'-), *n.* 1. an inseparable friend. 2. a second self; a perfect substitute or deputy. 3. another aspect of one's personality. [1530-40; < L: another I]

**al-ter-idem** (äl'tär īdēm; Eng. äl'tär īdēm, äl'-), *n.* Latin. another exactly the same.

**al-ter-nant** (äl'tür nānt, äl'-; esp. Brit. äl tür', äl-), *adj.* 1. alternating; alternate. —*n.* 2. a variant linguistic form that occurs in alternation with others. [1630-40; < L]

**al-ter-nate** (v. äl'tär nāt', äl'-; adj., n. -nit), *v.*, *-nat-ed*, *-nat-ing*, *adj.*, *n.* 1. to interchange repeatedly and regularly with one another in time or place (usu. fol. by *with*): *Day alternates with night*. 2. to change back and forth between states, actions, etc.: *He alternates between hope and despair*. 3. to take turns: *The children alternate in doing chores*. 4. Elect. to reverse direction or sign periodically. —*v.t.* 5. to perform or do in succession or one after another. 6. to interchange successively or regularly: *to alternate hot and cold compresses*. —*adj.* 7. interchanged repeatedly one for another: *Winter and summer are alternate seasons*. 8. reciprocal; mutual: *alternate acts of kindness*. 9. every second one of a series: *Read only the alternate lines*. 10. ALTERNATIVE (def. 4). 11. Bot. a. placed singly at different heights on the axis, on each side in succession, or at definite angular distances from one another, as leaves on a stem. b. opposite to the intervals between other parts: *petals alternate with sepals*. —*n.* 12. a person authorized to take the place of another who is temporarily absent. [1505-15; < L *alternātus*, pp. of *alternāre* to alternate, v. der. of *alternus* by turns] —*al-ter-nate-ly*, *adv.*

**al-ter-nate an-gle**, *n.* one of a pair of nonadjacent angles made by the crossing of two lines by a third line.

**al-ternating cur-rent**, *n.* an electric current that reverses direction at regular intervals, having a magnitude that varies continuously in a sinusoidal manner. *Abbr.*: AC. Compare DIRECT CURRENT. [1830-40]

**al-ter-na-tion** (äl'tär nāshən, äl'-), *n.* 1. the act of alternating or the state of being alternated. 2. alternate succession; repeated rotation: *the alternation of the seasons*. 3. variation in the form of a linguistic unit as it occurs in different environments or under different conditions. [1605-15; < LL]

**alterna-tion of genera-tions**, *n.* the alternation in an organism's life cycle of dissimilar reproductive forms, esp. the alternation of sexual with asexual generations. [1855-60]

**al-ter-na-tive** (äl tür'nā tiv, äl'-), *n.* 1. a choice limited to one of two or more possibilities: *the alternative of riding or walking*. 2. one of these choices: *The alternative to riding is walking*. 3. a possible or remaining choice: *no alternative but to walk*. —*adj.* 4. affording a choice between two or more things. 5. (of two choices) mutually exclusive so that if one is chosen the other must be rejected. 6. employing or following nontraditional or unconventional ideas, methods, etc.: *an alternative newspaper*. [1580-90] —*al-ter-na-tively*, *adv.* —*Syn.* See choice.

**alter-na-tive school'**, *n.* a school having a flexible or nontraditional curriculum. [1970-75]

**al-ter-na-tor** (äl'tär nāt'ər, äl'-), *n.* a generator of alternating current. [1890-95]

**al-the-a** or **al-thae-a** (äl thē'ə), *n.*, *pl.* **-the-as** or **-thae-as**. 1. the rose of Sharon, *Hibiscus syriacus*. 2. any plant belonging to the genus *Althaea*, of the mallow family, having lobed leaves and showy flowers in a spikelike cluster, including the hollyhocks and marsh mallows. [1660-70; < NL *Althaea* < Gk *alitha* marsh mallow]

**Al-thing** (äl'thīng, äl'-), *n.* the parliament of Iceland. [*< ON*; see ALL, THING']

**al-tho** (äl thō'), *conj.* *Pron.* *Spelling.* although.

**al-torn** (äl'hōrn'), *n.* a valved brass musical instrument that is the alto member of the cornet family. [1855-60; < G. = *Alt ALTO* + *HORN*]

**al-though** (äl thō'), *conj.* in spite of the fact that; even though; though. [1275-1325; ME *al though* ALL (adv.) even + THOUGH]

**al-ter** or **al-to**, a combining form meaning "height," "altitude": *altimeter*. [ME < L *alti*, comb. form of *altus* high]

**al-tim-e-ter** (äl tim'i tar, äl'ta mē'tər), *n.* an aneroid or radio barometer used chiefly in aircraft to ascertain flight altitude. [1820-30]

**al-tim-e-try** (äl tim'i trē), *n.* the science of measuring altitude, as by an altimeter. [1690-1700] —*al'ti-met'ri-cal* (äl'ta mē'trē kəl), *adj.*

**al-ti-pla-no** (äl'ta plā'ñō, äl'-), *n.* a plateau region in South America, situated in the Andes of Argentina, Bolivia, and Peru. [*< AmerSp. = alti-ALTI- + Sp *plano* PLAIN']*

**al-ti-tude** (äl'ti tōōd', äl'tōōd'), *n.* 1. the height of a thing above a given planetary reference plane, esp. above sea level on earth. 2. extent or distance upward; height. 3. the angular distance of a heavenly body above the horizon. 4. a. the perpendicular distance from the vertex of a geometric figure to the side opposite the vertex. b. the line through the vertex of a geometric figure perpendicular to the base. 5. Usu. **altitudes**, a high place or region: *mountain altitudes*. 6. high or exalted position, quality, etc.: *rise in power to a certain altitude*. [1350-1400; ME < L *altitudō*; see ALTI-, TUDE] —*al'ti-tu'di-nal*, *adj.* —*Syn.* See HEIGHT.

**al/titude sick/ness**, *n.* a disorder associated with the low oxygen content of the atmosphere at high altitudes, in acute conditions resulting in prostration, shortness of breath, and cardiac disturbances, and in chronic conditions resulting in thickened and poorly circulating blood. [1915-20]

**al-to** (äl'tō), *n.*, *pl.* *-tos*, *adj.* —*n.* 1. CONTRALTO. 2. COUNTERNO. 3. the second highest part of a four-part chorus. 4. the second highest instrument in a family of musical instruments. —*adj.* 5. of, pertaining to, or having the tonal range of an alto. [1775-85; < It < L *altus* high]

**al-to-**, var. of ALTI-: *al-tostratus*.

**al-to/clef**, *n.* a sign locating middle C on the third line of the staff. See illus. at *CLEF*. [1875-80]

**al-to-cu-mu-lus** (äl'tō kyōō'myā ləs), *n.*, *pl.* *-li* (-lē'). a cloud of a class characterized by globular masses or rolls in layers or patches: of medium altitude, about 8000-20,000 ft. (2450-6100 m). [1890-95]

**al-together** (äl'tō geth'ər, äl'tō geth'ər), *adv.* 1. wholly; entirely: completely: *an altogether fitting memorial*. 2. with all or everything included: *The debt amounted altogether to twenty dollars*. 3. with everything considered; on the whole: *Altogether, I'm glad it's over*. —*Idiom.* 4. in the altogether, Informal. nude. [1125-75; var. of ME *al togeder*. See ALL, TOGETHER] —*Usage.* The forms ALTOGETHER and ALL TOGETHER, though often indistinguishable in speech, are distinct in meaning. The adverb ALTOGETHER means "wholly, entirely, completely": *an altogether considerate report*. The phrase ALL TOGETHER means "in a group": *The children were all together in the kitchen*.

**Al-to-na** (äl tōō'nə), *n.* a city in central Pennsylvania. 52,800.

**al-to-re-lie-vo** (äl'tō rēlē'vō), *n.*, *pl.* *-vos*. HIGH RELIEF. [1710-20; < It *alto rilievo* high relief]

**al-to-str-a-tus** (äl'tō strā'təs, -strā'təs), *n.*, *pl.* **-stra-ti** (-strā'ti, -strā'tē). a cloud of a class characterized by a generally uniform gray sheet or layer: of medium altitude, 8000-20,000 ft. (2450-6100 m). [1890-95]

**al-tri-cial** (äl trish'əl), *adj.* (of an animal species) helpless at birth or hatching and requiring parental care for a period of time (opposed to precocial). [1870-75; < L *altric-*, s. of *altrix* wet nurse, nourisher = (al/ere) to nourish (cf. ALIMENT) + -trix -TRIX] + *-al'*]

**al-truis-m** (äl trōō'iz'm), *n.* 1. the principle or practice of unselfish concern for the welfare of others (opposed to egoism). 2. behavior by an animal that may be to its disadvantage but that benefits others of its kind. [1850-55; < F *altruisme* (perh. coined by A. Comte, on the model of *égoisme*) = *au/trui* others (< VL \**alterui*, obl. form of L *alter* other, with *-ui* from *cui* to whom; *-i* restored from L *alter*) + *-isme* -ISM] —*al-tru-ist*, *n.* —*al-tru-is-tic*, *adj.* —*al-tru-is-ti-cal-ly*, *adv.*

**Al-U-bay-yid** (äl'ōō bāy'ēd), *n.* El OBEID.

**al-u-la** (äl'yā lə), *n.*, *pl.* *-lae* (-lē'). 1. Also called *bastard wing*. **winglet**, a group of small, relatively stiff feathers at the inner end of a bird's wing. 2. a membranous lobe at the base of each wing of a dipterous insect. [1765-75; < NL dim. of L *ala* wing; see ALA, -ULE] —*al'u-lar*, *adj.*

**al-u-mi** (äl'am), *n.* 1. a crystalline solid, aluminum potassium sulfate,  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$ , used as an astringent and styptic and in dyeing and tanning. 2. any of a class of analogous double sulfates. [1275-1325; ME < AF < L *alumen*]

**al-lum<sup>2</sup>** (äl'üm), *n.* an alumna or alumnum. [by shortening]

**al-u-min-**, *alum-*

**al-u-min-a** (äl'üm'mə nə), *n.* the natural or synthetic oxide of aluminum,  $Al_2O_3$ , occurring in nature in a pure crystal form as corundum. [1780-90; < L *alumīn-*, s. of *alūmēnum ALUM* + -A\*]

PRONUNCIATION KEY: *act*, *cape*, *dāre*, *pārt*, *set*, *ēven*; *if*, *ice*; *ox*, *nō*, *fōr*, *oil*, *bōk*, *bōt*, *out*; *up*, *ürge*; *sing*; *shoe*; *thin*, *that*; *zh* in *treasure*. *ə* = *a* in *alone*, *i* in *easily*, *o* in *gallop*, *u* in *circus*; *\** in *fire* (*fīr*), *hour* (*ou'r*).

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FIG. 1

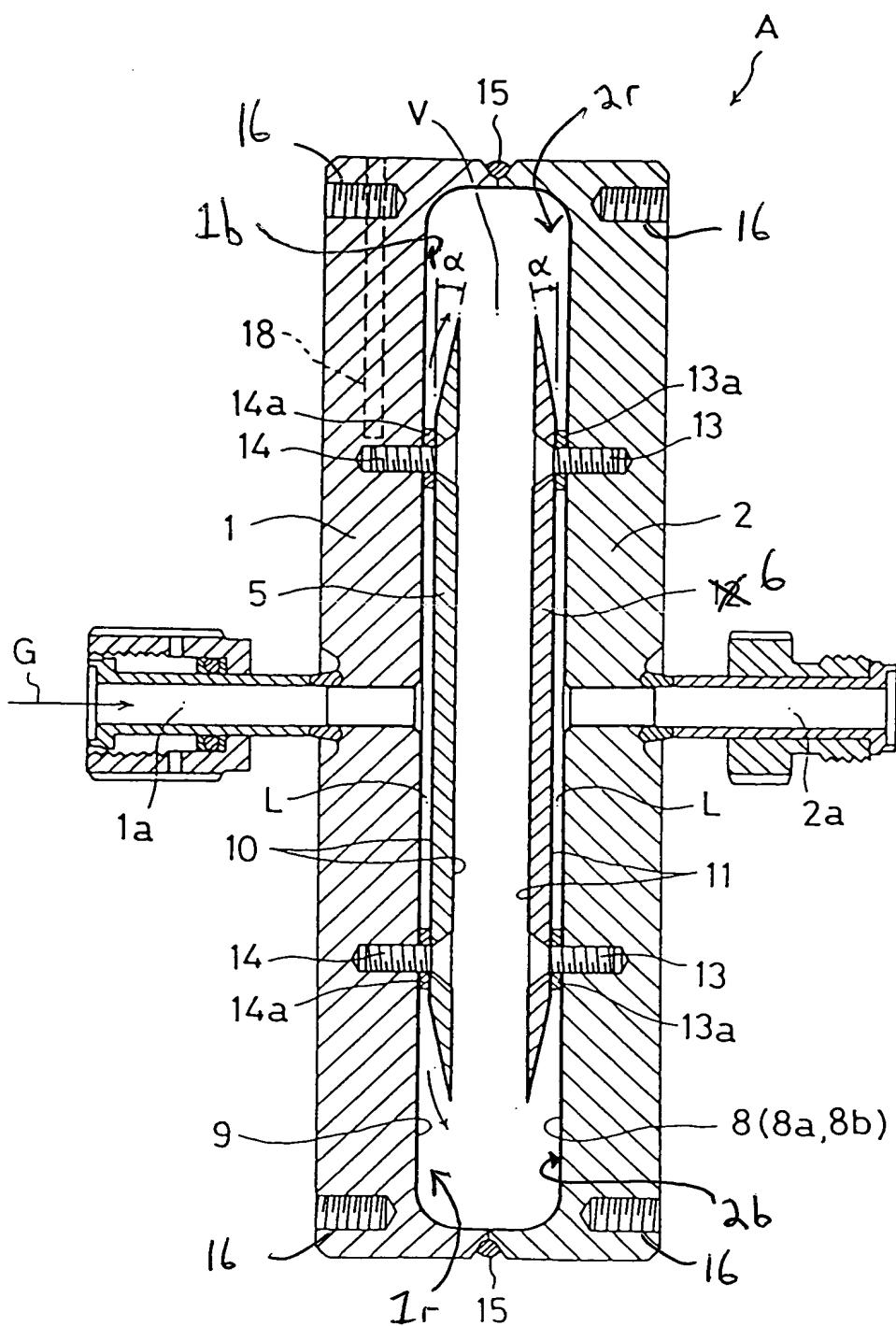


FIG. 5

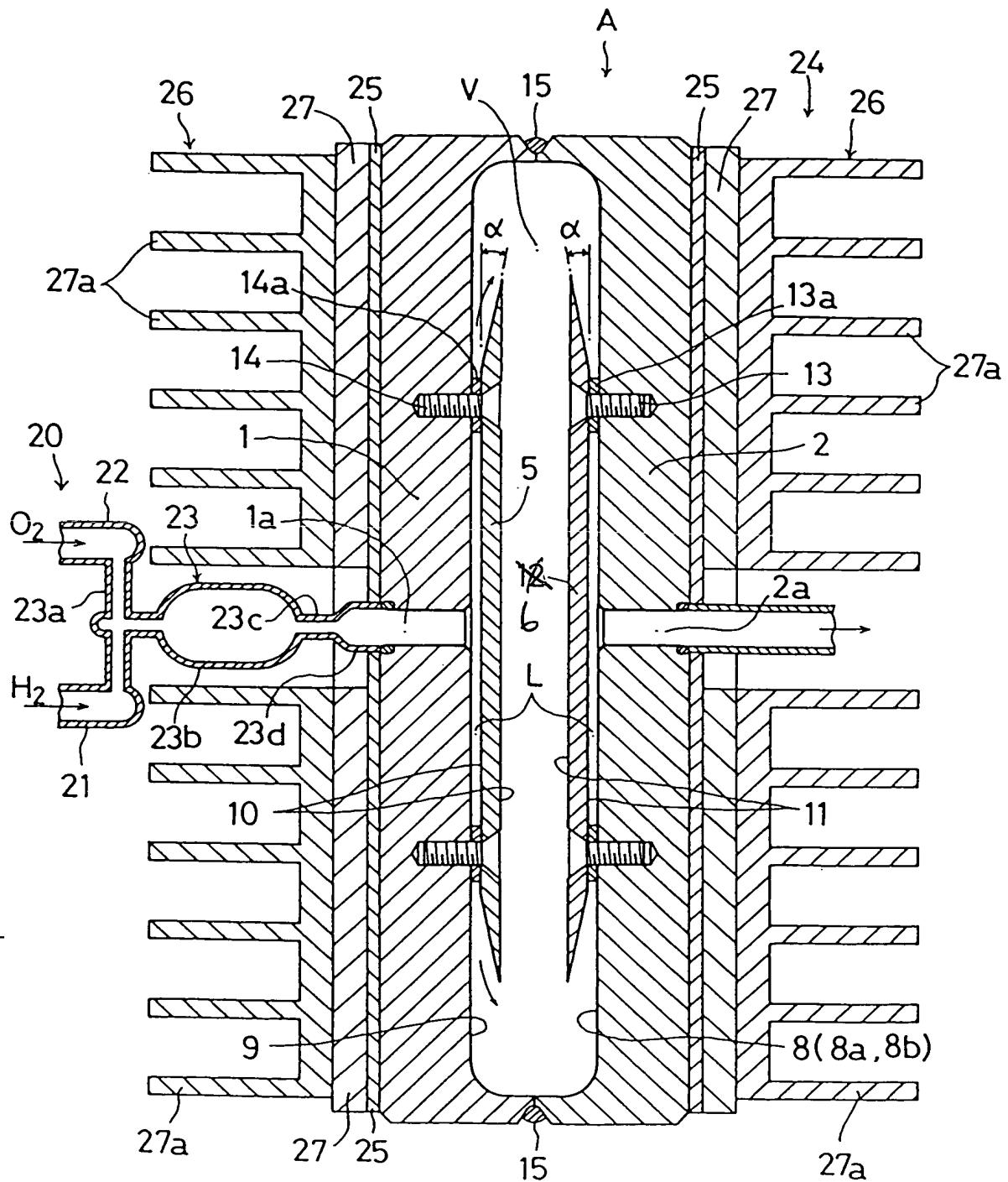


FIG. 6

## Prior Art

